REMARKS/ARGUMENT

Claims 1-11 have been canceled herein without prejudice, and claims 12-23 have been added herein. Accordingly, claims 12-23 are currently pending in the present application. It is respectfully submitted that the new claims do not add new matter, have adequate support throughout the Specification, and are currently in allowable condition.

Applicants would like to thank the Examiner for considering the references submitted with the Information Disclosure Statement filed on January 7, 2002, and for providing Applicants with an initialed copy of the corresponding PTO-1449 form. Otherwise, Applicants respectfully traverse all claim rejections for the reasons that follow.

I. REJECTIONS OF CLAIMS 1-11 UNDER 35 U.S.C. § 112, 2ND PARAGRAPH

Claims 1-11 were rejected as indefinite under 35 U.S.C. § 112, second paragraph, for allegedly being narrative in structure and failing to conform to U.S. practice. Applicants have canceled claims 1-11 herein, thereby mooting the rejections of these claims. Furthermore, it is respectfully submitted that new claims 12-23 are definite under § 112. Accordingly, it is kindly requested that the rejections of claims 1-11 under 35 U.S.C. § 112, second paragraph, be withdrawn.

II. REJECTIONS OF CLAIMS 1-11 UNDER 35 U.S.C. § 112, 2ND PARAGRAPH

Claims 1-11 were also rejected as indefinite under 35 U.S.C. § 112, second paragraph, for allegedly omitting structural cooperative relationships between elements. As stated above, Applicants have canceled claims 1-11 herein, thereby mooting the rejections of these claims. Furthermore, it is respectfully submitted that new claims 12-23 contain adequate structural cooperative relationships between elements. Accordingly, it is kindly requested that the rejections of claims 1-11 under 35 U.S.C. § 112, second paragraph, be withdrawn.

III. REJECTIONS OF CLAIMS 1-11 UNDER 35 U.S.C. § 102(b)

Claims 1-11 were rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 5,790,574 to Rieger et al. (hereinafter "Rieger"). Respectfully, Applicants traverse.

Claims 1-11 have been canceled herein without prejudice, thereby mooting the rejections of these claims. Furthermore, it is respectfully submitted that new claims 12-23 are allowable over Rieger.

An object of the present invention is to provide an all-in-one laser arrangement, which may be switched between a passively mode-locked resonator arm and an amplifying arm to produce a series of amplified laser pulses. During a pulse forming phase, a laser pump unit of the laser arrangement is switched to the passively mode-locked resonator arm to produce a series of low-power mode-locked laser pulses. During an amplifying phase, the laser pump unit of the laser arrangement is switched to an amplifying arm to amplify the low-power mode-locked laser pulses. For this purpose, claim 12 relates to a laser arrangement to produce a plurality of amplified laser pulses, comprising: a common arm including a pump unit having a pumped laser crystal . . . mode-locking and amplifying arms; and a switching arrangement controllable to optically switch the laser pulses between the common arm and one of the mode locking and amplifying arms, the common arm and the mode-locking arm forming a first resonator arm, the common arm and the amplifying arm forming a second resonator arm, the mode-locking arm including a passive mode-locking arrangement configured to passively mode-lock phases of the laser pulses, . . . wherein, during a pulse forming phase, the switching arrangement is controlled to switch the laser pulses between the common arm and the mode-locking arm . . . and during an amplifying stage, the switching arrangement is controlled to switch the laser pulses between the common arm and the amplifying arm.

Rieger purportedly concerns a solid state laser arrangement having high power and low cost. (Rieger, Abstract). As characterized, a mode locked laser oscillator 2 generates a series of laser pulses, which are passed through a double pass amplifier section 24 before being directed to a moving copper tape target 27 by a polarizing beam splitter 26. (Rieger, col. 3, lines 34-50; Figure 1). In one embodiment, the laser oscillator 2 includes a laser diode array 61 to pump a laser crystal rod 67 and produce a laser S, which is reflected by a polarized beam splitter 71 into a folded resonator cavity. The resonator cavity includes an active mode locker 75, an acousto optics Q-switch 73, and a $\lambda/4$ electro optics Pockels cell 69 for cavity dumping. In operation, the mode locked pulses build up in the resonator cavity between a high reflectivity

mirror 77 and a high reflectivity coating on the back surface of the laser crystal rod 67. Once the Pockels cell 69 is switched on, the polarization of the pulses rotates 90 degrees, thereby causing the beam splitter 71 to transmit a seed pulse to the amplifier section 24. After the seed pulse is transmitted to the amplifier section 24, the laser oscillator begins generating a new set of mode-locked pulses for generating the next seed pulse. (Rieger, col. 6, lines 36-61; Figure 6).

The amplifier section 24 comprises two amplifying rods 28, 32, which act together with a reflectivity (HR) mirror 38 to perform a 2-pass amplification of the seed pulse. For this purpose, the amplifier section 24 includes 64 modules of 50 Watt per module laser diode arrays 40 , the outputs of which are channeled into the amplifying rods 28, 32 to amplify the seed pulse. (Rieger, col. 3, lines 37-61; Figures 3, 4).

To reject a claim based on anticipation, a single prior art reference must identically disclose each and every limitation of the claim. See Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628 631 (Fed. Cir. 1987). In accordance with this standard, it is respectfully submitted that Rieger does not identically disclose "a common arm including a pump unit . . . the common arm and [a] mode-locking arm forming a first resonator arm, the common arm and [an] amplifying arm forming a second resonator arm," as recited in claim 1.

As described above, an embodiment of Rieger purportedly provides a laser oscillator configured to produce a series of mode-locked pulses for transmitting a seed pulse to an amplifying circuit. However, the laser oscillator of Rieger (i.e., the laser pump unit) operates only to produce the mode-locked pulses, not to amplify the pulses once mode-locked. Rather, Rieger provides a separate amplifying circuit having its own dedicated and exclusive circuitry for amplifying the seed pulse (i.e., 64 modules of 50 Watt per module laser diode arrays). In this manner, the mode-locking and amplifying stages of Rieger share no common optical circuitry and are kept completely separate from one another Thus, Rieger simply does not disclose "a common arm including a pump unit . . . the common arm and [a] mode-locking arm forming a first resonator arm, the common arm and [an] amplifying arm forming a second resonator arm."

Further regarding claim 1, it is respectfully submitted that Rieger does not disclose "a passive mode-locking arrangement configured to passively mode-lock phases of the laser pulses," as recited in this claim. With respect to the embodiments of Rieger that

purportedly employ a resonator cavity to generate a series of mode-locked pulses to transmit a seed pulse, these embodiments disclose only an active mode locker configured to mode lock the pulses. Rieger discusses a passive saturable absorber in conjunction only with embodiments that do not include a resonator and, as such, do not include a resonator arm, as recited in claim 12. (Rieger, col. 9, lines 40-55).

IV. CONCLUSION

In view of the foregoing, it is respectfully submitted that all pending claims are currently in allowable condition. Accordingly, reconsideration and prompt allowance of all pending claims is therefore earnestly solicited.

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as First Class Mail in an envelope addressed to: Asst. Commissioner for Patents, Washington, D.C. 20231, on March 18, 2003

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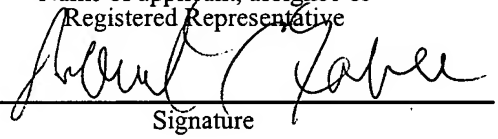

Signature

March 18, 2003
Date of Signature

RCF:BND:msd

Respectfully submitted,

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APPENDIX A

"CLEAN" VERSION OF EACH PARAGRAPH/SECTION/CLAIM
37 C.F.R. § 1.121(b)(ii) AND (c)(i)

CLAIMS (with indication of new):

12. (New) A laser arrangement to produce a plurality of amplified laser pulses, comprising:

a common arm including a pump unit having a pumped laser crystal, the pump unit being configured to generate a plurality of laser pulses;

mode-locking and amplifying arms; and

a switching arrangement controllable to optically switch the laser pulses between the common arm and one of the mode locking and amplifying arms, the common arm and the mode-locking arm forming a first resonator arm, the common arm and the amplifying arm forming a second resonator arm, the mode-locking arm including a passive mode-locking arrangement configured to passively mode-lock phases of the laser pulses, the amplifying arm being free of components that introduce loses;

wherein, during a pulse forming phase, the switching arrangement is controlled to switch the laser pulses between the common arm and the mode-locking arm to mode-lock the phases of the laser pulses on the first resonator arm, and during an amplifying stage, the switching arrangement is controlled to switch the laser pulses between the common arm and the amplifying arm to amplify the mode-locked laser pulses on the second resonator arm, thereby producing the amplified laser pulses.

13. (New) The laser arrangement according to claim 12, wherein the switching arrangement includes a first polarization-sensitive beam divider optically coupled to the mode-locking and amplifying arms, and further including a polarization rotating arrangement optically coupled to the beam divider and to the common arm, the polarization rotating arrangement being controllable to rotate a polarization of the laser pulses to switch the laser pulses of the common arm between one of the mode-locking and amplifying arms.

14. (New) The laser arrangement according to claim 13, wherein the polarization rotating arrangement is a Pockels cell.

15. (New) The laser arrangement according to claim 13, wherein the common arm includes a second polarization-sensitive beam divider arranged in a path of the laser pulses to couple out the amplified laser pulses.

16. (New) The laser arrangement according to claim 12, wherein the passive mode-locking arrangement includes a saturable absorber.

17. (New) The laser arrangement according to claim 16, wherein the saturable absorber is a saturable semiconductor absorber.

18. (New) The laser arrangement according to claim 16, wherein the saturable absorber is arranged to terminate the mode-locking arm.

19. (New) The laser arrangement according to claim 12, wherein the mode-locking arm includes a linear loss element causing a high energy accumulation in the pumped laser crystal.

20. (New) The laser arrangement according to claim 19, wherein the linear loss element includes a l/4 platelett.

21. (New) The laser arrangement according to claim 12, wherein the pump unit is a continuous wave diode pump unit.

22. (New) The laser arrangement according to claim 12, further comprising a pumping arrangement configured to pump the pumped laser crystal.

23. (New) The laser arrangement according to claim 22, wherein the pumping arrangement includes one of a lamp-pump arrangement and a laser-pump arrangement.